

metamorphosis of the cord into the medulla oblongata. It is unfortunate that the author has inverted all the eight figures so as to make the ventricular floor the inferior aspect, and the basilar parts the superior. This he has done to accommodate the cerebral sections to the spinal ones figured in the conventional way. Now, as it was easier for Mahomet to go to the mountain than for the latter to come to the former, so it would have been far simpler to invert the spinal sections from their customary and incorrectly figured position, than to turn the entire brain upside down.

On the whole the work will prove more useful to him who desires a general view of the cerebral architecture than to him who desires correct topographical information. In presenting it to the French medical public the translators have done a service which cannot be undervalued. The views of the cerebral functions, their complexity, and the manifold tracts subservient to them, which have been promulgated by Meynert, will serve by becoming familiar to the French medical public to act as a healthy antidote against the vagaries which, whether in the shape of the "nihilism" of Brown-Sequard or the metallo-therapy of his great opponent, can only be founded on an imperfect conception of the nervous mechanism.

While we do not hesitate to insist that in many respects the work of Huguenin is faulty, and that its translators have failed to correct some of the more serious errors, it must be admitted that there is no better *readable* version of modern cerebral anatomy in the market than the present one. We may hence be permitted to hope that a still better and safer guide to the cerebro-spinal anatomy will be furnished to the American reader in the forthcoming American edition, which by more careful notes, better illustrations, and above all, a due reference to cotemporary researches, will avoid the errors as well of the original as of the translation before us.

E. C. SPITZKA.

III.—HANDWRITING : ITS PHYSIOLOGY AND PATHOLOGY.

DIE SCHRIFT: GRUNDZUEGE IHRER PHYSIOLOGIE UND PATHOLOGIE.

(*Handwriting: its Physiology and Pathology.*) Von Dr. A. Erlenmeyer. Stuttgart: Adolf Bonz & Co., 1879.

In his preface the author informs us that he has collected specimens of handwriting of patients for some years, and that on reviewing them for publication, so many questions turned up that he was forced to prepare some physiological ground for the subject; hence its publication in the form of a brochure of some 70 pages. The book commences with some reflections on the cause of the direction of script. The habitual writing of European nations from left to right, the author attributes to the

greater ease with which motions of abduction can be performed as compared with adducting movements, since in abduction the trunk is not in the way. But this view, it seems to us, is not borne out by every-day experience; not even in the instances mentioned by Erlenmeyer, such as piano-playing and turning of a crank, movements which, according to him, are more easily executed in abduction than in adduction. But Erlenmeyer argues further that left-handed people ought hence to be able to write more easily from right to left, and cites in proof the ancient Jews, whose script had this direction. A questionable passage in the Talmud is interpreted by him to imply the frequency of writing with the left hand in those days. In a spirit of speculation difficult to understand, he deduces from the above assertions conversely that our right-handedness is acquired by writing a script running from left to right. The first chapter concludes with some remarks on "reversed writing" (*Spiegelschrift*). Buchwald has recently shown that patients suffering from right-sided hemiplegia write backhands (*i. e.* reversed) unconsciously when told to use the left hand, so that their script can be read best with the aid of a mirror. Erlenmeyer cites some cases, and adds that the same tendency exists also in all children when writing with the left hand. The speculative tendency embellishing this first chapter is fortunately not to be found in the rest of the book, which is written on the whole on a more substantial basis.

In the following chapter the author condemns the usual school directions ordering children to perform the writing movements with the entire hand, instead of moving the fingers alone, which latter motion, he claims on good ground, is much less fatiguing. Another point insisted upon is the fact that the most natural way is to write, not in a straight line, but in a curve, the radius of which is the forearm resting upon the abeyan as the centre. Writing in a straight line requires a constant correction of the natural tendency, which not all persons are able to achieve.

Script is composed of: 1, up-strokes; 2, down-strokes; and 3, curved lines. 1, up-strokes require movements of extension. The muscles involved are the extensor dig. comm., innervated by the radial nerve and the interossei (of the first two fingers) actuated by the ulnaris, while the thumb is kept in position by the united action of the extensor poll. long., opponens and adductor pollicis muscles (radial, median and ulnar nerves). 2. The down stroke is a movement of flexion (flexor digit comm. profund.). The thumb is at the same time pulled upon by the flexor poll. longus, while in sweeps the hand itself is flexed by the flexor carpi ulnaris. The nerves involved are the median and ulnar nerves. 3. The curved strokes require the alternating action of the above muscles, and besides, according to the direction of the curve, the abductors and adductors of the fingers. Since all nerves of the forearm are called into action during writing, the isolated paralysis of one of them will not render one set of

movements impossible, but will be manifested in writing in all strokes. Paralysis of the radial nerve alone would not show itself in the down strokes.

Since the mechanical movements required in writing are the same in all persons, one might expect no difference in different handwritings. In fact there is very little when children first begin to learn writing. It is only in later years that the mental traits of persons influence their handwriting. The changes in handwriting due to morbid states the author divides very properly into, (1) mechanical, and (2) psychic alterations. The former variety refers only to the execution of the letters; its subdivisions are the (*a*) ataxia, and (*b*) the tremulous handwriting. The psychic alterations of writing are on the other hand characterized by errors in spelling and grammar. They are classified by Erlenmeyer as (1) those dependent on a conscious impulse (*bewusst zwangsartigen*) (*a*) Agraphia, and (*b*) Paragraphia, and (2) the voluntary, but unconscious variety (*willkürlich unbewussten*)—the writing in general paresis. Writers' spasm is not included in this list, since it either appears as one of the mechanical disturbances or renders writing altogether impossible. The term *ataxia* is applied to handwriting by the author in the same way as we are accustomed to speak of an ataxic gait. The writing is characterized by awkward and ill-proportioned execution of the letters; it is hence more or less illegible. Normally this form of writing occurs when the child first begins to learn writing. It is in that case the result of imperfect co-ordination of the movements. A similar inco-ordination results from affections of the cerebrum or cerebellum, or spinal ataxia, located in the cervical cord. The convalescence from intense infectious fevers disturbs the writing in the same manner. Intense fatigue can produce the same result, as can be easily shown by writing after over-exertion. Acute intoxication with alcohol or chloral will also render the writing ataxic.

The *tremulous* handwriting is not necessarily illegible. It is characterized only by wavy lines instead of straight strokes. It occurs normally in old age, as well as in all conditions of tremor. All persons write with a trembling hand when subjected to cold. This form is also quite marked in cases of chronic alcoholism before the victim has obtained the desired draught. This writing is to be expected in disseminated sclerosis, rhythmic chorea and paralysis agitans. The tremulous movement may take place in any one plane. If they occur in a plane perpendicular to the paper, the writing must consist of dotted lines. This form can be readily produced in the normal person by tetanizing the radial nerve and extensor digit. communis muscles by an induction current while writing.

In the *psychic* disturbances of writing the execution of the letters may be perfect, but there are errors in spelling and grammar, or the sense may be wanting altogether. In *agraphy* and *paragraphy*, the patient knows that he is writing incorrectly, but

cannot help it. In *general paresis*, on the other hand, the patient writes incorrectly also, though not in the same manner at different times, but claims that he is correct. The former disorders are considered in a very lucid manner, the same mode of reasoning being applied in the analysis of writing which Kussmaul uses in the analysis of speech. While we cannot follow the author into his details, some idea of his considerations can be obtained from the following classification:

1. Ataxic agraphy—the incapability of co-ordinating the letters distinct from the mechanical disturbance.
2. Amnesic agraphy—the loss of the mental images (*Erinnerungsbilder*) of the different letters.
3. Paragraphy—the impossibility of adapting the corresponding letters to the conceptions (*Vorstellungen*).

A schema of the brain paths concerned in writing is here introduced. But while following the author through this pleasantly written part, we are not to forget that this is also purely hypothetical. The writing in general paresis becomes complicated as a rule with one or both forms of mechanical disturbances in the latter part of the disease. It is crowded with errors, but these are not due to the impossibility of writing otherwise; the patient can readily change them, and if sufficiently attentive will even correct them. The writing in general paresis bears the stamp of the disease so characteristic in the different movements.

In the last chapter Erlenmeyer sums up his results in order to estimate their importance for practical purposes. His conclusions we can state verbally:

1. The writing permits an early diagnosis of an organic diffuse affection of the cortex.
2. It confirms the differential diagnosis between the above disorder and a merely sympathetic cortical affection.
3. By means of the writing we can determine whether every case of general paresis is of a syphilitic origin.
4. Writing enables the physician to prognosticate with certainty the cause of general paresis.
5. The writing is an objective test for the therapeutic success consequent to certain drugs or the application of the constant current; it reveals also the psychic improvement in spontaneous remissions of certain brain diseases.

Conclusion No. 5 can be accepted readily by every reader, but the other statements are by no means adequately supported by the text of the work or the cases given in illustration. Like so many writers of monographs, Erlenmeyer is apt to overrate the import of his subject. But with the exception of those parts already referred to as rather speculative, the monograph is on the whole written in a very lucid, cool manner. The classification adopted by the author may appear artificial on glancing hastily at the book, but a careful study of the excellent plates appended will convince any one that the grouping of the disturbances of writing is well founded. On the whole a clinicist of experience

will hardly find any direct clinical statement in the book which is entirely new, but the arrangement of the subject, which, by the way, has never been handled similarly, as well as the sound discussion, render the book worthy of careful reading. H. G.

IV.—ACUTE ASCENDING PARALYSIS.

- I. RECHERCHES SUR LES LÉSIONS DU SYSTÈME NERVEUX DANS LA PARALYSIE ASCENDANTE AIGUE. Par le Dr. J. Dejerine, Ancien Interne des Hôpitaux de Paris, Membre lauréat de la Société Anatomique (Prix Godard, 1879). Paris, 1879. (*Researches in regard to Lesions of the Nervous System in Acute Ascending Paralysis.*)
- II. CONTRIBUTION A L'HISTOIRE DES NEVRITES—NEVRITES DISSEMINÉES. Par le Dr. J. Gros, Ancien Interne des Hôpitaux de Lyon. Paris, 1879. (*Contribution to the History of Neuritis.*)

Since Landry, in 1859, first directed attention to them, a class of cases of paralysis have, in great measure, been a puzzle to pathologists. At first it was hardly credited that they constituted a distinct disorder, and they were considered by most writers to be only peculiar instances of rapid myelitis, to which they have much resemblance in their clinical features. But carefully reported observations by such observers as Vulpian, Hayem, Westphal, and others, have demonstrated, at least approximately, that they deserve to rank as a distinct affection, pathologically and even clinically separate from any ordinary forms of myelitis or other spinal disorder. The two monographs, the titles of which head this notice, are among the latest contributions to the literature of the subject, and as such they deserve our attention.

M. Dejerine's memoir is a critical study of the pathology of the disorder. He first opens with a historical review of the subject, in the course of which he also lays down the plan on which he proposes to treat the subject. He shows how, in late years, while the researches of Charcot, Vulpian, and others, at the Salpêtrière had elucidated the pathology and history of myelitis, that a few careful observations by Pellegrino Levi, Petitfils, Hayem and Westphal, in which careful microscopic examinations were made of the cord, and no lesions discovered, have given ground for the recognition of Landry's disease as a distinct morbid species. Some observations he rejects as imperfect, such as those of Chalvet and Calastri, and all those in which the case terminated otherwise than fatally, and with an autopsy. He believes with Vulpian, that there is no proof that these latter were actually cases of acute ascending paralysis of Landry, as-